

WHAT IS CLAIMED IS:

1. A video encoding apparatus comprising motion compensation prediction means for generating a predicted image of a coding target frame by dividing the coding target frame into a plurality of blocks, 5 generating a prediction reference image that are formed by providing interpolated pixels which are produced by interpolation between integer pixels from integer neighborhood pixels in a predetermined region of a reference frame, and determining a motion vector for the prediction reference images for each of the plurality of blocks,

the motion compensation prediction means having: complexity extraction means for extracting 15 complexity information which indicates a degree of complexity of movement from the reference frame for each of the plurality of blocks; and

predicted image generating means for generating the predicted image by using the prediction reference image to which filtering pixels are provided in accordance with the complexity information on the basis of a predetermined rule which increases the number of the filtering pixels which have pixel values produced by applying a low-pass filter of which spectral band-pass in low frequency band is narrow among a plurality 20 of low-pass filters with different high-frequency 25

cutoff characteristics to neighborhood integer pixels.

2. A video encoding method including a motion compensation prediction step in which motion compensation prediction means generates a predicted image of a coding target frame by dividing the coding target frame into a plurality of blocks, generating a prediction reference image that are formed by providing interpolated pixels which are produced by interpolation between integer pixels from integer neighborhood pixels in a predetermined region of a reference frame, and determining a motion vector for the prediction reference image for each of the plurality of blocks,

wherein, in the motion compensation prediction step complexity extraction means extracts complexity information which indicates a degree of complexity of movement from the reference frame for each of the plurality of blocks, and

predicted image generating means generates the predicted image by using the prediction reference image to which filtering pixels are provided in accordance with the complexity information extracted by the complexity extraction means on the basis of a predetermined rule which increases the number of the filtering pixels which have pixel values produced by applying a low-pass filter of which spectral band-pass in low frequency band is narrow among a plurality of

low-pass filters with different high-frequency cutoff characteristics to neighborhood integer pixels.

3. The video encoding method according to claim 2, wherein the complexity extraction means uses an absolute value of a differential motion vector of a block surrounding the block for which the complexity information is to be extracted as the complexity information.

4. The video encoding method according to claim 2 further comprising conversion step in which conversion means converts predicted residual difference image produced by calculating a difference between the coding target frame and the predicted image into a set of coefficients on the basis of a predetermined conversion rule,

wherein the complexity extraction means use the numbers of non-zero coefficients among the coefficients in a block surrounding the blocks for which the complexity information is to be extracted as the complexity information.

5. The video encoding method according to claim 2, wherein the complexity extraction means uses an absolute value of a differential motion vector of the blocks for which complexity information is to be extracted as the complexity information.

6. A video encoding program which causes a

computer to function as motion compensation prediction means for generating a predicted image of a coding target frame by dividing the coding target frame into a plurality of blocks, generating a prediction reference image that are formed by providing interpolated pixels which are produced by interpolation between integer pixels from integer neighborhood pixels in a predetermined region of a reference frame, and determining a motion vector for the prediction reference images for each of the plurality of blocks,

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the motion compensation prediction means having:  
complexity extraction means for extracting complexity information which indicates a degree of complexity of movement from the reference frame for each of the plurality of blocks; and

predicted image generating means for generating the predicted image by using the prediction reference image to which filtering pixels are provided in accordance with the complexity information extracted by the complexity extraction means on the basis of a predetermined rule which increases the number of the filtering pixels which have pixel values produced by applying a low-pass filter of which spectral band-pass in low frequency band is narrow among a plurality of low-pass filters with different high-frequency cutoff characteristics to neighborhood integer pixels.

7. A video decoding apparatus comprising motion compensation prediction means for generating a prediction reference image that are formed by providing interpolated pixels which are produced by interpolation between integer pixels from integer neighborhood pixels in a predetermined region of a reference frame, and generating a predicted image by dividing the decoding target frame into a plurality of blocks and performing motion compensation based on a motion vector included in compression data by using the prediction reference image,

the motion compensation prediction means having:

complexity extraction means for extracting complexity information which indicates a degree of complexity of movement from the reference frame for each of the plurality of blocks; and

predicted image generating means for generating the predicted image by using the prediction reference image to which filtering pixels are provided in accordance with the complexity information on the basis of a predetermined rule which increases the number of the filtering pixels which have pixel values produced by applying a low-pass filter of which spectral band-pass in low frequency band is narrow among a plurality of low-pass filters with different high-frequency cutoff characteristics to neighborhood integer pixels.

8. A video decoding method including motion compensation prediction step in which motion compensation prediction means generates a prediction reference image that are formed by providing 5 interpolated pixels which are produced by interpolation between integer pixels from integer neighborhood pixels in a predetermined region of a reference frame, and generates a predicted image by dividing the decoding target frame into a plurality of blocks and performing 10 motion compensation based on a motion vector included in compression data by using the prediction reference image,

wherein, in the motion compensation prediction step, complexity extraction means extracts complexity 15 information which indicates a degree of complexity of movement from the reference frame for each of the plurality of blocks, and

predicted image generating means generates the predicted image by using the prediction reference image 20 to which filtering pixels are provided in accordance with the complexity information extracted by the complexity extraction means on the basis of a predetermined rule which increases the number of the filtering pixels which have pixel values produced by 25 applying a low-pass filter of which spectral band-pass in low frequency band is narrow among a plurality of

low-pass filters with different high-frequency cutoff characteristics to neighborhood integer pixels.

9. The video decoding method according to claim 8, wherein the complexity extraction means uses an absolute value of a differential motion vector of a block surrounding the block for which the complexity information is to be extracted as the complexity information.

10. The video decoding method according to claim 8 further including decoding step in which decoding means decodes compression data including compression codes which are generated by converting predicted residual difference image produced by calculating a difference between the decoding target frame and the predicted image into a set of coefficients on the basis of a predetermined conversion rule and encoding the set of coefficients,

20 wherein the complexity extraction means uses the numbers of non-zero coefficients among the coefficients in a block surrounding the blocks for which the complexity information is to be extracted as the complexity information.

25 11. The video decoding method according to claim 8, wherein the complexity extraction means uses an absolute value of a differential motion vector of the blocks for which complexity information is to be

extracted as the complexity information.

12. The video decoding program which causes a computer to function as motion compensation prediction means for generating a prediction reference image that  
5 are formed by providing interpolated pixels which are produced by interpolation between integer pixels from integer neighborhood pixels in a predetermined region of a reference frame, and generating a predicted image by dividing the decoding target frame into a plurality  
10 of blocks and performing motion compensation based on a motion vector included in compression data by using the prediction reference image,

the motion compensation prediction means having:  
complexity extraction means for extracting  
15 complexity information which indicates a degree of complexity of movement from the reference frame for each of the plurality of blocks; and

predicted image generating means for generating the predicted image by using the prediction reference image to which filtering pixels are provided in accordance with the complexity information extracted by the complexity extraction means on the basis of a predetermined rule which increases the number of the filtering pixels which have pixel values produced by  
20 applying a low-pass filter of which spectral band-pass  
25 in low frequency band is narrow among a plurality of

low-pass filters with different high-frequency cutoff characteristics to neighborhood integer pixels.